

The Downtown Bloomington Recycling Center  
Yearly Report  
and  
Response to the Certified Tech Park Request for Proposals



Compiled by  
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## **Introduction**

The Downtown Bloomington Recycling Center recently celebrated three years of service to the Bloomington Community. During that time, we've made some measurable progress in the field of recycling and waste management, both operationally and economically. Our partnership with the City of Bloomington and the Monroe County Solid Waste Management District continues to yield positive benefits for all parties involved. The past year has seen some encouraging improvements to the way we do business, and the response from the public has been overwhelmingly supportive.

This report will help to illustrate the environmental impact of the operation, and will underline the importance of continued operation of the DBRC at 489 W 10<sup>th</sup> St. as the CTP evolves, and as demand for recycling services increases in downtown Bloomington--particularly concerning electronic and special waste streams that will inevitably result from the development of the Tech Park.

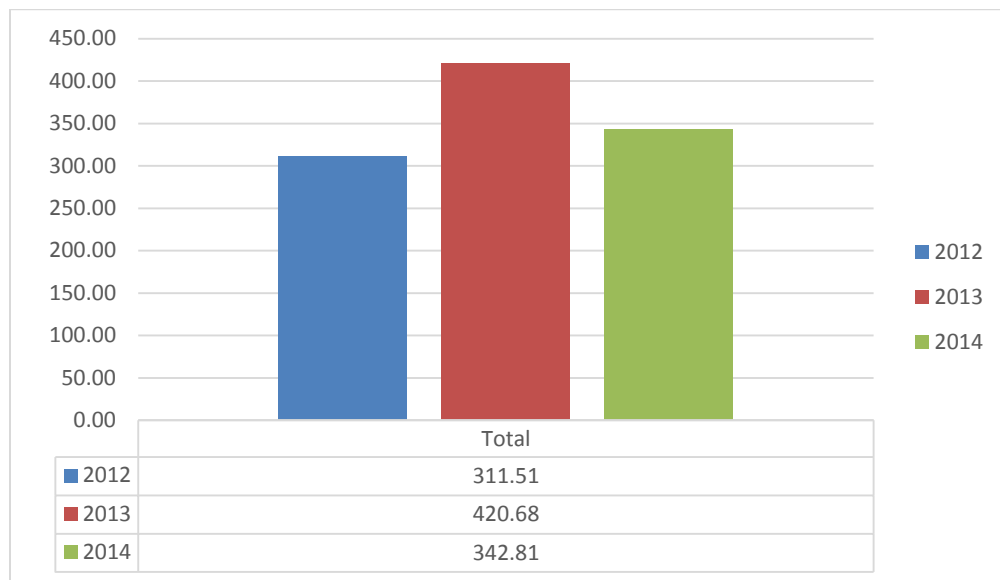
### The Numbers:

Material passing through the DBRC is divided into 7 categories:

- Corrugated Cardboard
- Mixed Paper
- Steel Cans
- Aluminum Cans
- Glass Bottles and Jars
- Plastics #1-7
- Scrap Metals

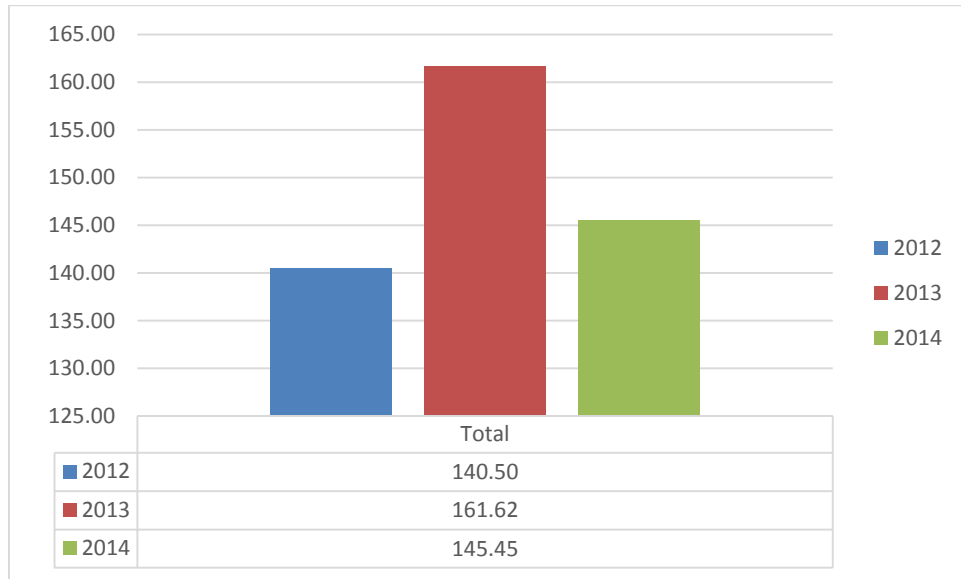
The following graphs represent the total tonnage, by material type, passing through the DBRC over the past three years.

### All Materials:

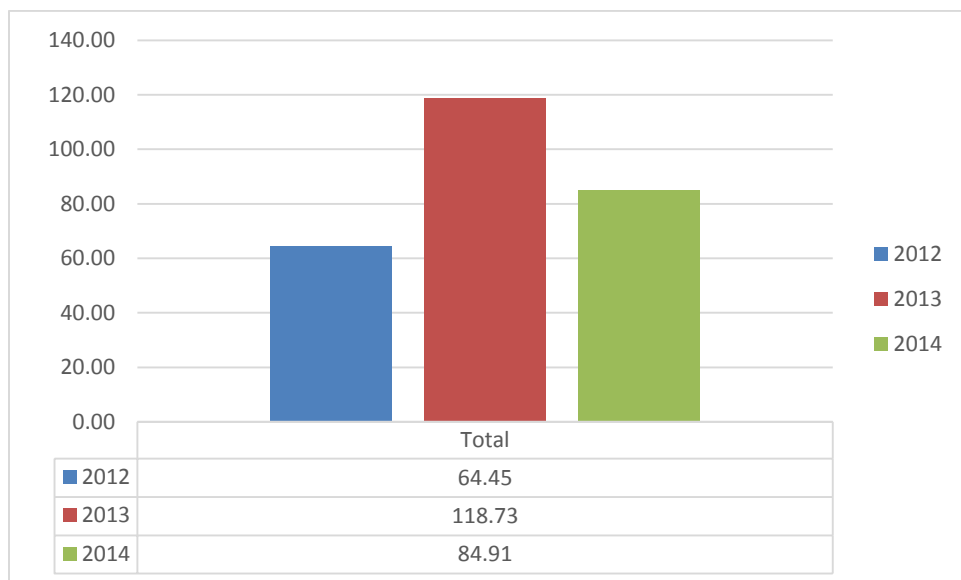


The nearly 20% reduction in overall tonnage between 2013 and 2014 is a result of Pedal Power's reduced use of the facility.

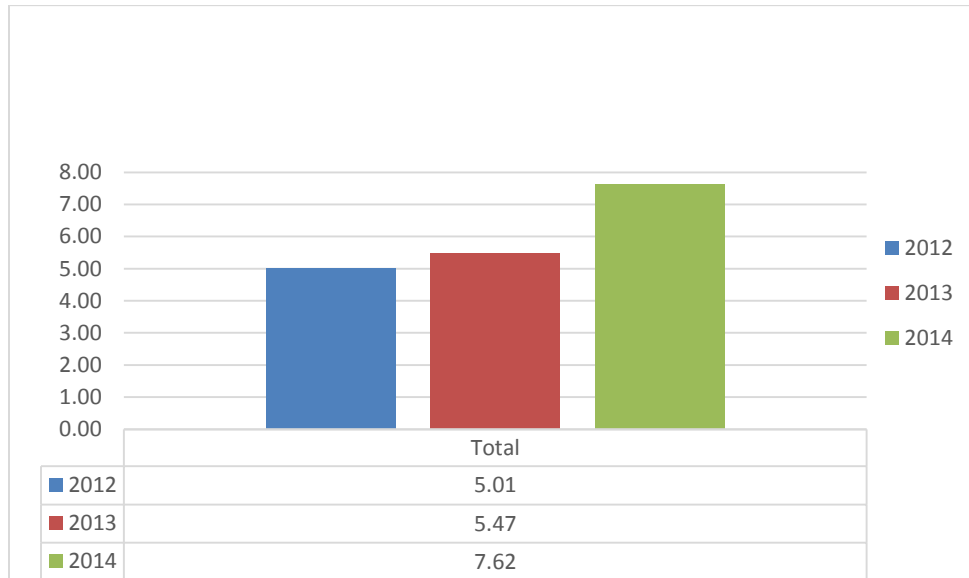
## Corrugated Cardboard



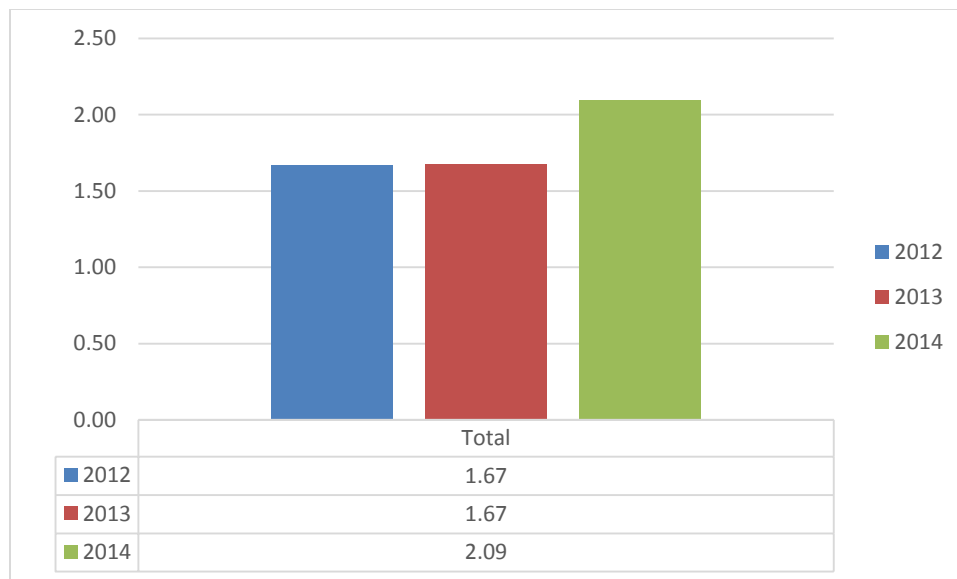
## Mixed Paper



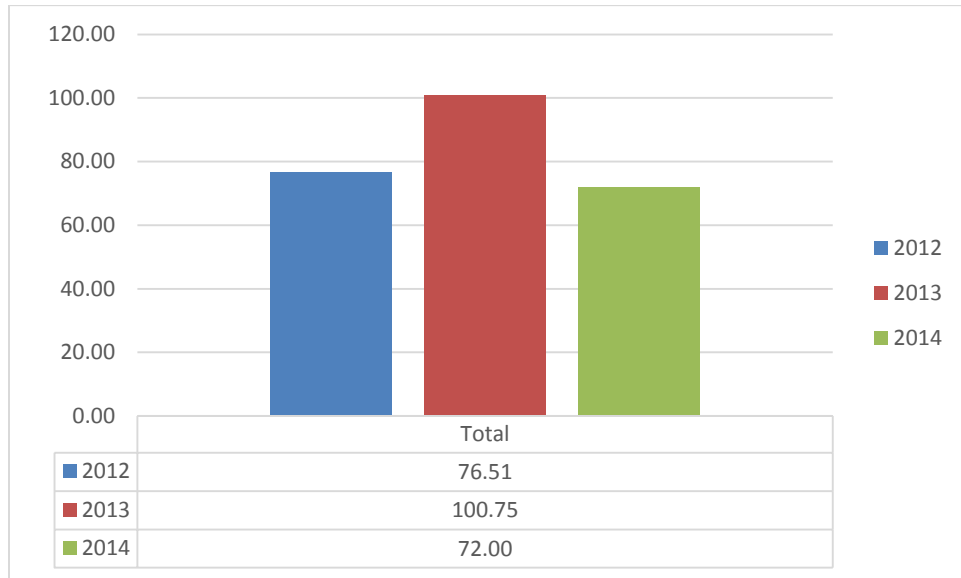
### Steel Cans



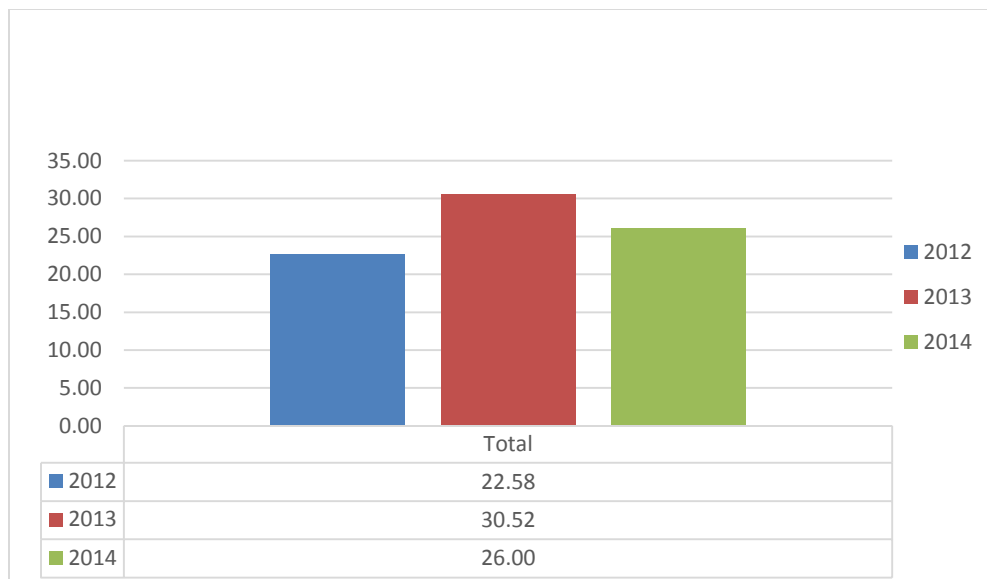
### Aluminum Cans



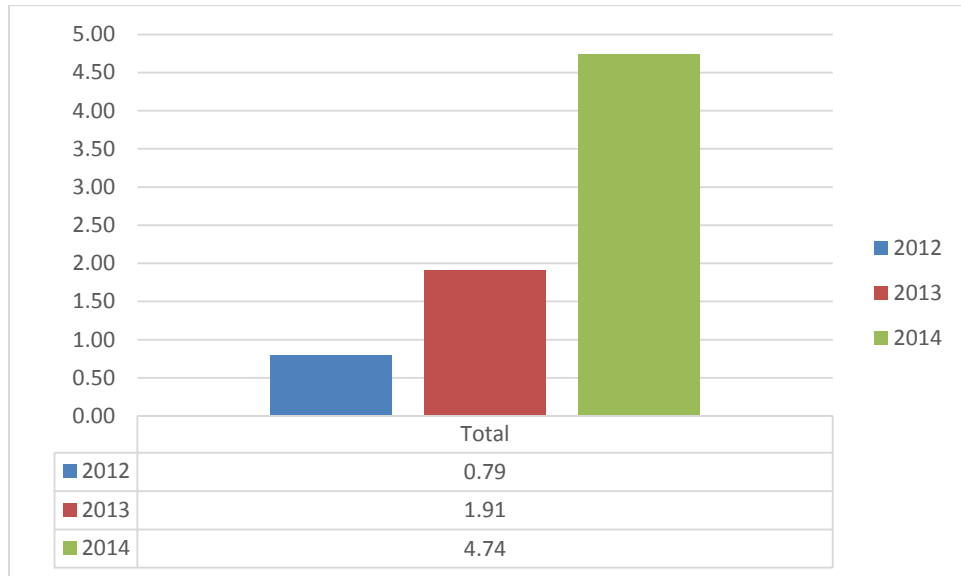
### Glass Bottles and Jars



### Plastics #1-7



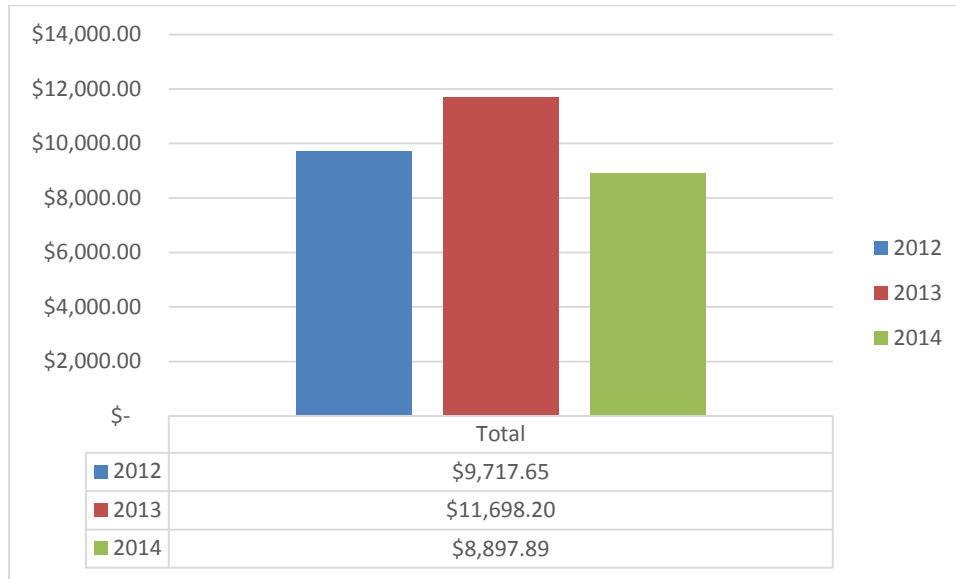
### Scrap Metals



Please note the aggressive increase in tonnage from scrap and other metals over the past three years. To offset the economically worthless material we collect, we must make up the difference somehow. Much of the “scrap” collected has been processed as e-waste. The economic future of the DBRC will be largely based on our ability to process e-waste and other valuable metals.

## Revenue

Revenue generated from sale of materials is as follows:



Initially, the DBRC pledged 10% of *profit* from corrugated cardboard to Middle Way House. Due to low revenue and high labor costs, we have only been able to realize this pledge for the past seven months, yielding \$110. Moving forward, the minimum payment to MWH will be \$20 or 10% of the monthly corrugated revenue, whichever is higher.

## Shipping and Labor Costs

Over the past 12 months, the new order of operations has produced some remarkable savings in both labor and shipping:



Labor costs, which ran at about \$40,000/year in 2012 and 2013, have been reduced to approximately \$10,000/year. This is due to an increase in participation by IU SPEA interns and volunteers.

Total expenses have also dropped significantly:

- \$30,525.32 in 2012
- \$24,003.35 in 2013
- \$11,176.66 in 2014

**Environmental Impact Study**  
by  
**Joseph Tanzer, SPEA MPA Candidate**

Since January 2012, the Downtown Bloomington Recycling Center (DBRC) has collected 1,067.84 tons of recyclables<sup>1</sup>, averaging over 356 tons annually over a three-year period.<sup>2</sup> The center accepts aluminum cans, corrugated cardboard, glass, mixed paper, plastics (1-7), scrap metal, and steel cans. The total tonnage of recyclables does not include hazardous materials, including batteries and CFLs, or large appliances.

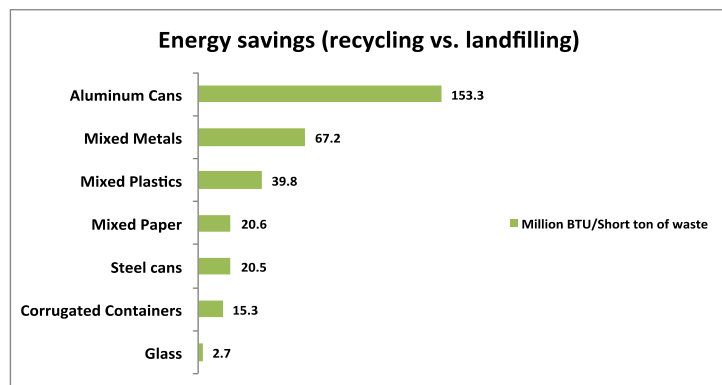
Mr. Roeder's operation has saved 17,402 million BTU, the equivalent to 159 households' annual energy consumption, 3,068 barrels of oil, or 142,578 gallons of gasoline.<sup>3</sup> Further, it has resulted in a reduction of 2,620 metric tons of carbon dioxide equivalent, or 714 metric tons of carbon equivalent.

The Downtown Bloomington Recycling Center provides numerous benefits to the local community and the public as a whole. Aside from offering a convenient solution for local residents that are not eligible for roadside pickup, the DBRC fosters community involvement and cooperation. The DBRC facility represents a model of sustainability, from collecting rainwater to generating electricity with solar photovoltaic panels. The solar PV system has generated 1,626 kWh of electricity so far, resulting in savings of 1.12 metric tons of carbon dioxide emissions.<sup>4</sup>

The goal of this memo is to demonstrate the environmental benefits of the DBRC. It considers the energy and emissions reductions directly attributable to Mr. Roeder's operation. It provides a description of how these numbers were produced. Finally, it presents various alternative scenarios should the DBRC cease to exist.

## Methodology

The energy savings and emission reductions were calculated using the Environmental Protection Agency's (EPA) iWARM tool. iWARM is able to calculate the amount of energy saved from recycling, carbon equivalent emissions reductions, and CO<sub>2</sub>e (carbon dioxide equivalent) reductions. It can compare baseline to alternative scenarios, while accounting



Source: EPA data

<sup>1</sup> November and December values are approximated based on monthly averages in 2014

<sup>2</sup> According to 2012 figures, this number is equivalent to 13% of annual recycling collected by the City of Bloomington (2012 values for Bloomington found on city's website)

<sup>3</sup> Conversions provided by EPA's iWARM tool

<sup>4</sup> Assumption is solar PV is displacing coal-fired generation; number calculated using EPA's Greenhouse Gas Equivalencies Calculator; see <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>

for various landfill and waste transport characteristics.<sup>5</sup>

Energy savings are calculated by multiplying weight by the sum of the recycled input credit process and transportation energy. The resulting value is measured in mMBTU (million metric British Thermal Units).

Net greenhouse gas emissions are calculated using the following formula:

$$\text{Net GHG emissions} = \text{Gross manufacturing GHG emissions} - (\text{increase in carbon stocks} + \text{avoided GHG emissions})^6$$

## Results

Tables 1-4 represent total energy savings. Tables 5-8 represent metric tons of carbon dioxide equivalent reductions. Tables 9-12 represent metric tons of carbon equivalent reductions.

Each model compares a baseline scenario (recycling) to an alternative scenario (landfill). Four scenarios have been created to model the impact of closure of the DBRC. The numbers used represent 3-year totals from the DBRC. The assumption is that DBRC will recycle at least the same amount over the next 3 years, but actual projections are not included in the model.

Recycling corrugated containers, mixed paper, and mixed plastics resulted in the greatest energy savings. Corrugated containers and mixed paper resulted in the greatest reductions in carbon equivalent and carbon dioxide equivalent. It should be noted that recycling aluminum cans results in the greatest energy savings by type of recyclable, carbon dioxide equivalent, and carbon equivalent reductions.

## Discussion

The four scenarios represent outcomes if there was a 100%, 75%, 50%, and 25% change in how visitors of the Downtown Bloomington Recycling Center choose to dispose of their recyclables. These scenarios only consider what would happen should those who choose to recycle at the DBRC take their recyclables to landfills instead. Energy savings and emissions reductions also take into account the distance to various waste facilities, using an average of 60 miles to landfills and recycling facilities capable of processing DBRC's recyclables. It does not account for additional greenhouse gas emissions that may occur should people travel to the South Walnut facility, though this would likely result in a net increase in emissions.

The study does not determine what percentage of people that use the DBRC would landfill their recyclables instead. However, according to a poll surveying 2,013 adults (18 and older) conducted in November 2014, 90% of Americans believe "recycling sites need to be more readily accessible to consumers." The study also found that just 64% of adults in the Midwest

<sup>5</sup> Environmental Protection Agency (2014, June). *Energy Impacts*. Retrieved from [http://epa.gov/epawaste/conserve/tools/warm/pdfs/Energy\\_Impacts.pdf](http://epa.gov/epawaste/conserve/tools/warm/pdfs/Energy_Impacts.pdf)

<sup>6</sup> Environmental Protection Agency (2014, June). *Warm Background and Overview*. Retrieved from [http://epa.gov/epawaste/conserve/tools/warm/pdfs/Background\\_Overview.pdf](http://epa.gov/epawaste/conserve/tools/warm/pdfs/Background_Overview.pdf)

either always or often recycle.<sup>7</sup> Convenience plays a large role in peoples' decision to recycle. And because Bloomington does not offer curbside pickup to buildings that have more than four units,<sup>8</sup> DBRC offers a convenient alternative to residents of Bloomington.

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<sup>7</sup> Institute of Scrap Recycling Industries Inc. (ISRI). (2014). Harris Poll. Retrieved from [https://www.isri.org/docs/default-source/recycling-analysis-\(reports-studies\)/harris-survey-on-america's-attitudes-and-opinions-about-reycling-2014.pdf?sfvrsn=4](https://www.isri.org/docs/default-source/recycling-analysis-(reports-studies)/harris-survey-on-america's-attitudes-and-opinions-about-reycling-2014.pdf?sfvrsn=4)

<sup>8</sup> Kenninger, J. (2011, August 12). *Talking trash – What happens when garbage pickup costs but recycling is free? Cities in Indiana are beginning to find out.* Retrieved from <http://www.indianalivinggreen.com/talking-trash-what-happens-when-garbage-pickup-costs-but-recycling-is-free-cities-in-indiana-are-beginning-to-find-out/>

## Appendix

Table 1. 100% Landfill

Material	Baseline Scenario		Alternative Scenario		Change (Alt - Base) Million BTU
	Tons recycled	Million BTU	Tons landfilled	Million BTU	
Aluminum cans	6	-873	6	3	876
Steel cans	16	-311	16	9	320
Glass	237	-485	237	143	628
Corrugated containers	452	-6,773	452	132	6,905
Mixed paper	274	-5,566	274	83	5,649
Mixed metals	5	-326	5	3	329
Mixed plastics	78	-3,067	78	47	3114
Net					17821

Energy Use from Recycling Scenario (million BTU):	-17,401
Energy Use from Landfill Scenario (million BTU):	420
Net Change in Energy Use (million BTU):	17,821

Table 2. 75% Landfill, 25% Recycle

Material	Baseline Scenario		Alternative Scenario		Change (Alt - Base) Million BTU
	Tons recycled	Million BTU	Tons landfilled	Tons recycled	Million BTU
Aluminum cans	6	-873	4	1	-216
Steel cans	16	-311	12	4	-71
Glass	237	-485	178	59	-14
Corrugated containers	452	-6,773	339	113	-1594
Mixed paper	274	-5,566	206	69	-1330
Mixed metals	5	-326	4	1	-79
Mixed plastics	78	-3,067	59	20	-731
Net					13366

Energy Use from Recycling Scenario (million BTU):	-17,401
Energy Use from Landfill Scenario (million BTU):	-4035
Net Change in Energy Use (million BTU):	13,366

Table 3. 50% Landfill, 50% Recycle

Material	Baseline Scenario		Alternative Scenario		Change (Alt - Base) Million BTU
	Tons recycled	Million BTU	Tons landfilled	Tons recycled	Million BTU
Aluminum cans	6	-873	3	3	-435
Steel cans	16	-311	8	8	-151
Glass	237	-485	118	118	-171
Corrugated containers	452	-6,773	226	226	-3321
Mixed paper	274	-5,566	137	137	-2742
Mixed metals	5	-326	2	2	-162
Mixed plastics	78	-3,067	39	39	-1510
Net					8909

Energy Use from Recycling Scenario (million BTU):	-17,401
Energy Use from Landfill Scenario (million BTU):	-8492
Net Change in Energy Use (million BTU):	8,909

Table 4. 25% Landfill, 75% Recycle

Material	Baseline Scenario		Alternative Scenario		Change (Alt - Base) Million BTU
	Tons recycled	Million BTU	Tons landfilled	Tons recycled	Million BTU
Aluminum cans	6	-873	1	4	-654
Steel cans	16	-311	4	12	-231
Glass	237	-485	59	178	-328
Corrugated containers	452	-6,773	113	339	-5047
Mixed paper	274	-5,566	69	206	-4154
Mixed metals	5	-326	1	4	-244
Mixed plastics	78	-3,067	20	59	-2288
Net					4455

Energy Use from Recycling Scenario (million BTU):	-17,401
Energy Use from Landfill Scenario (million BTU):	-12946
Net Change in Energy Use (million BTU):	4,455

Table 5. 100% Landfill

Material	Baseline Scenario		Alternative Scenario		Change (Alt - Base) MTCO2e
	Tons recycled	Total MTCO2e	Tons landfilled	Total MTCO2e	
Aluminum cans	6	-52	6	0	52
Steel cans	16	-28	16	1	29
Glass	237	-64	237	11	75
Corrugated containers	452	-1,408	452	235	1,643
Mixed paper	274	-966	274	128	1,094
Mixed metals	5	-21	5	0	21
Mixed plastics	78	-80	78	3	83
Net					2,997

GHG emissions from recycling scenario (MTCO2E):	-2,619
GHG emissions from landfill scenario (MTCO2E):	378
Net change in GHG emissions (MTCO2E):	2,997

Table 6. 75% Landfill, 25% Recycle

Material	Baseline Scenario		Alternative Scenario		Change (Alt - Base) MTCO2e
	Tons recycled	Total MTCO2e	Tons landfilled	Tons recycled	
Aluminum cans	6	-52	4	1	-13
Steel cans	16	-28	12	4	-7
Glass	237	-64	178	59	-8
Corrugated containers	452	-1,408	339	113	-175
Mixed paper	274	-966	206	69	-145
Mixed metals	5	-21	4	1	-5
Mixed plastics	78	-80	59	20	-17
Net					2,249

GHG emissions from recycling scenario (MTCO2E):	-2,619
GHG emissions from landfill scenario (MTCO2E):	-370
Net change in GHG emissions (MTCO2E):	2,249

Table 7. 50% Landfill, 50% Recycle

Material	Baseline Scenario		Alternative Scenario		Change (Alt - Base) MTCO2e
	Tons recycled	Total MTCO2e	Tons landfilled	Tons recycled	
Aluminum cans	6	-52	3	3	-26
Steel cans	16	-28	8	8	-14
Glass	237	-64	118	118	-27
Corrugated containers	452	-1,408	226	226	-586
Mixed paper	274	-966	137	137	-419
Mixed metals	5	-21	2	2	-11
Mixed plastics	78	-80	39	39	-38
Net					1,498

GHG emissions from recycling scenario (MTCO2E):	-2,619
GHG emissions from landfill scenario (MTCO2E):	-1121
Net change in GHG emissions (MTCO2E):	1,498

Table 8. 25% Landfill, 75% Recycle

Material	Baseline Scenario		Alternative Scenario		Change (Alt - Base) MTCO2e
	Tons recycled	Total MTCO2e	Tons landfilled	Tons recycled	
Aluminum cans	6	-52	1	4	-39
Steel cans	16	-28	4	12	-21
Glass	237	-64	59	178	-47
Corrugated containers	452	-1,408	113	339	-997
Mixed paper	274	-966	69	206	-692
Mixed metals	5	-21	1	4	-16
Mixed plastics	78	-80	20	59	-59
Net					748

GHG emissions from recycling scenario (MTCO2E):	-2,619
GHG emissions from landfill scenario (MTCO2E):	-1871
Net change in GHG emissions (MTCO2E):	748

Table 9. 100% Landfill

Material	Baseline Scenario		Alternative Scenario		Change (Alt - Base) MTCE
	Tons recycled	Total MTCE	Tons landfilled	Total MTCE	
Aluminum cans	6	-14	6	0	14
Steel cans	16	-8	16	0	8
Glass	237	-18	237	3	20
Corrugated containers	452	-384	452	64	448
Mixed paper	274	-263	274	35	298
Mixed metals	5	-6	5	0	6
Mixed plastics	78	-22	78	1	23
Net					817

GHG emissions from recycling scenario (MTCE):	-715
GHG emissions from landfill scenario (MTCE):	103
Net change in GHG emissions (MTCE):	818

Table 10. 75% Landfill, 25% Recycle

Material	Baseline Scenario		Alternative Scenario		Change (Alt - Base) MTCE
	Tons recycled	Total MTCE	Tons landfilled	Tons recycled	
Aluminum cans	6	-14	4	1	-3
Steel cans	16	-8	12	4	-2
Glass	237	-18	178	59	-2
Corrugated containers	452	-384	339	113	-48
Mixed paper	274	-263	206	69	-40
Mixed metals	5	-6	4	1	-1
Mixed plastics	78	-22	59	20	-5
Net					613

GHG emissions from recycling scenario (MTCE):	-715
GHG emissions from landfill scenario (MTCE):	-101
Net change in GHG emissions (MTCE):	614

Table 11. 50% Landfill, 50% Recycle

Material	Baseline Scenario		Alternative Scenario		Change (Alt - Base) MTCE
	Tons recycled	Total MTCE	Tons landfilled	Tons recycled	
Aluminum cans	6	-14	3	3	-7
Steel cans	16	-8	8	8	-4
Glass	237	-18	118	118	-7
Corrugated containers	452	-384	226	226	-160
Mixed paper	274	-263	137	137	-114
Mixed metals	5	-6	2	2	-3
Mixed plastics	78	-22	39	39	-10
Net					408

GHG emissions from recycling scenario (MTCE):	-715
GHG emissions from landfill scenario (MTCE):	-305
Net change in GHG emissions (MTCE):	410

Table 12. 25% Landfill, 75% Recycle

Material	Baseline Scenario		Alternative Scenario		Change (Alt - Base) MTCE
	Tons recycled	Total MTCE	Tons landfilled	Tons recycled	
Aluminum cans	6	-14	1	4	-11
Steel cans	16	-8	4	12	-6
Glass	237	-18	59	178	-12
Corrugated containers	452	-384	113	339	-272
Mixed paper	274	-263	69	206	-189
Mixed metals	5	-6	1	4	-4
Mixed plastics	78	-22	20	59	-16
Net					205

GHG emissions from recycling scenario (MTCE):	-715
GHG emissions from landfill scenario (MTCE):	-510
Net change in GHG emissions (MTCE):	205

Note: negative value indicates an emissions reduction

a) Values have been rounded and thus may not always add up

b) For more information on how numbers were calculated, please visit

[http://epa.gov/epawaste/conserve/tools/warm/Warm\\_Form.html](http://epa.gov/epawaste/conserve/tools/warm/Warm_Form.html)

Table 13. Solar PV MTCE CO<sub>2</sub>e Savings

kWh	Emission factor	Metric tons of CO <sub>2</sub> e	Net Savings from Solar
1626	0.000689551	1.121209926	-1.121209926

\* If 1626 kWh were from coal-fired electricity, metric ton value would be equivalent to amount of CO<sub>2</sub> released when 1,204 pounds of coal are burned.

\*\* For more conversions, reference <http://www.epa.gov/cleanenergy/energy-resources/calculator.html#results>

### **Social and Economic Impact**

The DBRC allows people to take control of their recycling, and removes the private hauler from the equation. For the individual, this provides a degree of flexibility they would not otherwise have. For the business, it provides insurance against haulers' cost increases. One thing is for sure: while the private haulers' rates will go up year after year, the DBRC will never increase or decrease the cost to our customer. Free is free, and this creates a unique baseline for determining fair market value of waste and recycling services.

### **Thoughts on the Tech Park**

The CTP will create a vibrant new landscape in Downtown Bloomington. The economic impact will be enormous, and the potential for innovation and inspiration as fostered by the City of Bloomington will no doubt yield some wonderful things. However, the property upon which the DBRC currently resides will eventually be sold to the most appropriate candidate for development—and that raises some questions about the long-term viability of our operation. I have complete faith that the City's Department of Economic and Sustainable Development will make informed and bold decisions concerning the future of infill development on the plots currently for sale, but the DBRC is not in the CTP Master Plan. While the Master Plan is not etched in stone, it does describe a number of acceptable uses for the property, none of which is "recycling center."

This being the case, the only scenario I can envision for long-term survival is collaboration with whichever entity is awarded the property. Most people in Bloomington would like to see the DBRC continue to thrive for years to come. It is my goal to help make that happen. This project is the first new development in the CTP and represents a Public/Private collaboration combining positive environmental action, renewable energy, community building, and educational opportunities for our customers and interns. If the DBRC were to go away, years of intense effort and progress will go with it, and we will have lost the momentum and market share we've worked so hard to develop.

In conclusion, I'd like to thank the City for giving us the opportunity to exist and to serve at 489 West 10<sup>th</sup> St. Come what may, I will work towards an outcome that will generate the greatest benefit to the parties involved. If you'd like to contact me directly, feel free. I'd like to begin the dialogue with the developer ASAP after the awards are granted. Thanks!

